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Combat Crew

strategic air command

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AUGUST 1980

Combat Crew

Magazine of the Strategic Air Command - 31st Year of Publication

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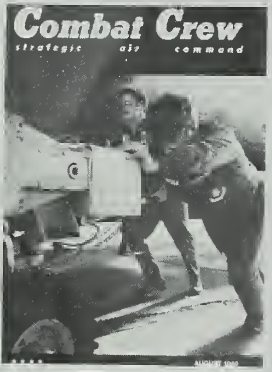

ON OUR COVER
A salute to GIANT SWORD 1980, and all those hard-working SAC people who participate.

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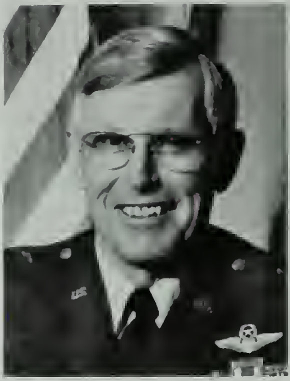

Maj Gen Andrew Pringle, Jr.
DCS/Operations, SAC

To a flash of light or other worldly tone, conditioned acts respond.
Behind each move, unspoken thoughts, of the bombs that lie beyond.
They live with patient waiting, with tactics, minds infused,
And the quiet murmur of the heart, that hopes it's never used.

From the poem Missileer
by Capt Robert A. Wyckoff

Why do we train the way we do? To insure the Intercontinental Ballistic Missile (ICBM) employment mandate — be on target on time, the first time — is met if the ICBM forces are ever executed. We won't get a second chance!

The ICBM forces comprise a vital part of the United States TRIAD of strategic systems. Nearly all of the 1,000 MINUTEMAN and 54 TITAN II ICBMs in Strategic Air Command's ICBM force are on alert 24 hours per day.

Our ICBM forces are the world's best. They're not the newest and they're not the largest. They're the best because of technological superiority and training excellence. Technological superiority, however, is a very perishable commodity, subject to change without warning with each new research breakthrough. This puts a premium on the human element — the combat crew member — and makes training of the 2,280 member combat crew force of paramount importance.

SAC's ICBM training philosophy is one of comprehensive initial qualification training administered, for the most part, by SAC's "University of Missilery," the 4315th Combat Crew Training Squadron (CCTS), followed by rigorous, intensive monthly recurring training at each operational wing by the training division. Both initial qualification and monthly recurring training are subject to continuous scrutiny and refinement to insure that the most up-to-date instructional and training techniques are used to train the missile crew force of the 1980's.

Because of the comprehensive nature of the train-

TRAINING TACIT WARRIORS

ing task, the responsibility for achieving and maintaining ICBM weapon system proficiency is shared between two initial training schools and each of the nine operational wings. Of course, the ultimate responsibility for competency lies with the individual crew member who must have the initiative, dedication and commitment to maintain proficiency. Because the "acid test" of a missile crew's ability is actual nuclear warfare, the training for such an eventuality can of necessity only be simulation. In fact, of the 160 tasks a crew member must perform, only 60 can be trained and evaluated under peacetime alert conditions in an operational launch control center. The remainder of these tasks are trained and evaluated in missile procedures trainers (MPTs), multimillion dollar electronic computer controlled weapon system simulators which closely approximate missile launch control centers in size and physical layout.

Initial training for TITAN II and MINUTEMAN students is quite different. TITAN II weapon system training begins with a 12-16 week course conducted by ATC at Sheppard AFB, TX. This basic course focuses on system function, operation, and location. The second phase of training is conducted by SAC's 4315th CCTS at Vandenberg AFB, CA. There, TITAN II officer and enlisted students spend 5-7 weeks being exposed to SAC combat crew requirements. The final segment of initial TITAN II training is conducted at operational wings where prospective crew members complete an upgrade training program designed to fully qualify each as a "mission ready" crew member.

MINUTEMAN instruction is centralized at the 4315th CCTS in an integrated Initial Qualification Training (IQT) program. With four variations of the MINUTEMAN system in the operational fleet, separate and distinct programs for each variation are conducted, all with the same goal. Each program is designed to produce a "mission ready" crew member at the end of the course.

Training conducted by the 4315th CCTS for both TITAN II and MINUTEMAN crew members is divided into three main areas: academics, missile procedures training, and emergency war order (EWO) training. Academics training provides classroom exposure to specific technical orders and other necessary conceptual information, presented in lecture/discussion format. Videotapes and sound/slide presentations are extensively used to reinforce the procedures taught in the classroom to prepare the student for the simulator. The theory learned in academics is practiced in the MPT. MPT exposure at Vandenberg varies among missile systems: a MINUTEMAN student will have about 150 hours of MPT exposure; a TITAN student approximately 42. EWO training is the final area of study. It involves classified instruction in the concepts and procedures the crew member would use in response to messages from the President, Joint Chiefs of Staff, and SAC Headquarters to support the Single Integrated Operations Plan.

In the MINUTEMAN programs, the three areas of study are integrated — one reinforcing the other in a building block method. The end of the course is very heavily concentrated in the MPT because student crew members having received all the weapon system information, must polish their procedures and techniques prior to a final comprehensive evaluation of their proficiency conducted by the 3901st Strategic Missile Evaluation Squadron (SMES). The 4315th CCTS training for TITAN II officer students begins with EWO. Following the officer EWO training, the TITAN II enlisted students arrive and, along with the officers, begin academic training. This academic training supplements the training received at Sheppard AFB. It is also the enlisted students' first exposure to SAC requirements. During the final phase of 4315 CCTS training, students training for each of the four TITAN crew positions are "teamed" for initial proficiency training in crew procedures in the MPT.

The final phase of TITAN II training is conducted by instructor personnel at each operational unit. Initial TITAN II training culminates when wing evaluators verify that each crew member possesses the required level of proficiency.

Although all MINUTEMAN students are mission ready when they leave Vandenberg and TITAN II students become mission ready after completing their unit's upgrade training program, the training cycle is far from complete. The new crew member performing alert finds that crew duty demands much self-discipline and conscientious effort to keep abreast of new developments and procedural changes.

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Each wing's training division has a cadre of instructors which deal with new and on-going training requirements by conducting several types of instruction. Some of these are:

— Recurring monthly weapon system classroom training.

— Monthly EWO classroom training and testing.

— Self-study packages which pose unusual weapon system problems or reinforce problem areas.

— Monthly classroom training and testing in the requirements for and use of secure codes.

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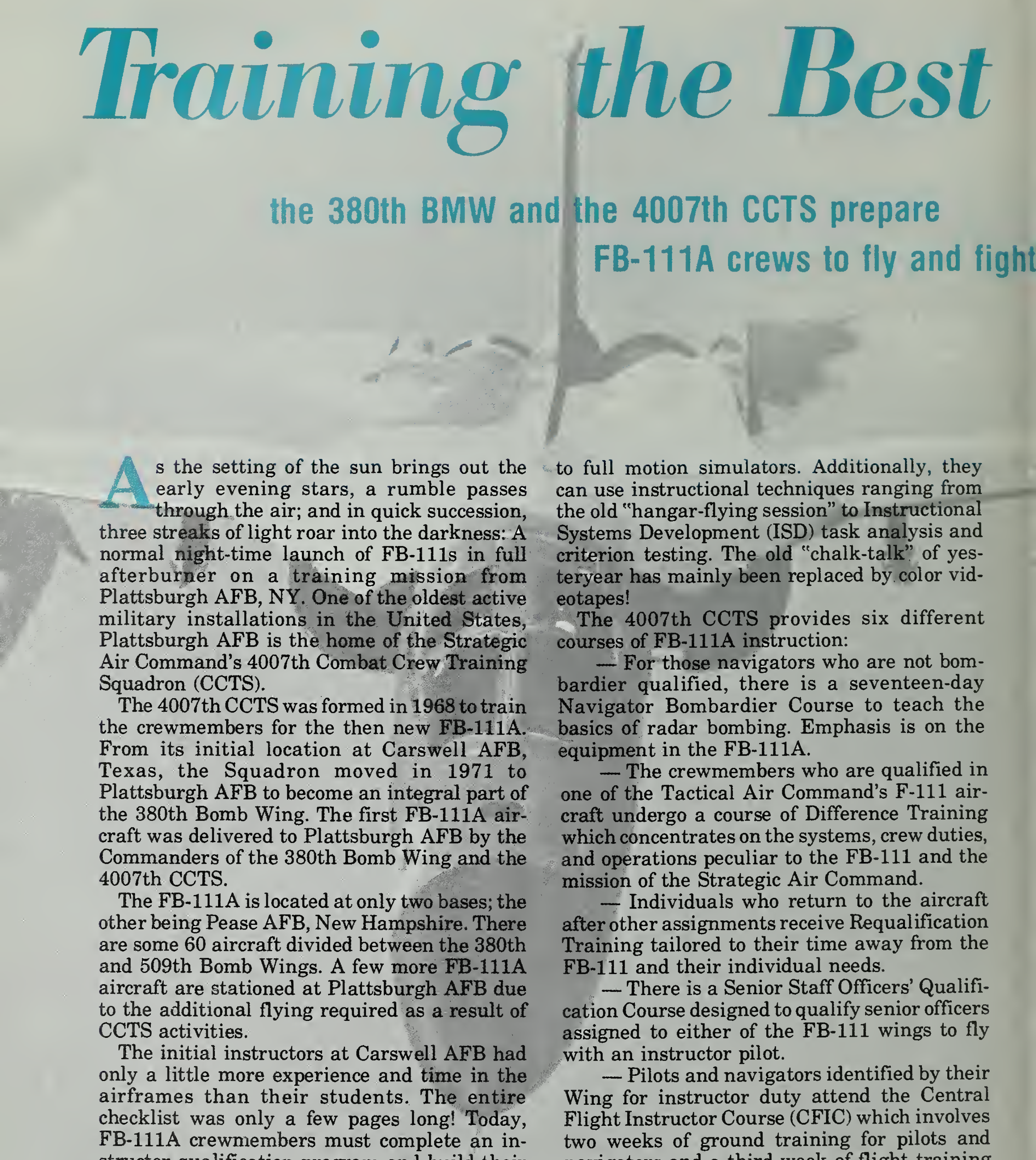
Training the Best

the 380th BMW and the 4007th CCTS prepare FB-111A crews to fly and fight



As the setting of the sun brings out the early evening stars, a rumble passes through the air; and in quick succession, three streaks of light roar into the darkness: A normal night-time launch of FB-111s in full afterburner on a training mission from Plattsburgh AFB, NY. One of the oldest active military installations in the United States, Plattsburgh AFB is the home of the Strategic Air Command's 4007th Combat Crew Training Squadron (CCTS).

The 4007th CCTS was formed in 1968 to train the crewmembers for the then new FB-111A. From its initial location at Carswell AFB, Texas, the Squadron moved in 1971 to Plattsburgh AFB to become an integral part of the 380th Bomb Wing. The first FB-111A aircraft was delivered to Plattsburgh AFB by the Commanders of the 380th Bomb Wing and the 4007th CCTS.

The FB-111A is located at only two bases; the other being Pease AFB, New Hampshire. There are some 60 aircraft divided between the 380th and 509th Bomb Wings. A few more FB-111A aircraft are stationed at Plattsburgh AFB due to the additional flying required as a result of CCTS activities.

The initial instructors at Carswell AFB had only a little more experience and time in the airframes than their students. The entire checklist was only a few pages long! Today, FB-111A crewmembers must complete an instructor qualification program and build their instructor experience in the tactical bomb squadrons before they are considered for assignment to the 4007th CCTS.

The CCTS instructors currently have an arsenal of the newest training devices and techniques — ranging from detailed mock-ups to full motion simulators. Additionally, they can use instructional techniques ranging from the old "hangar-flying session" to Instructional Systems Development (ISD) task analysis and criterion testing. The old "chalk-talk" of yesteryear has mainly been replaced by color videotapes!

The 4007th CCTS provides six different courses of FB-111A instruction:

— For those navigators who are not bombardier qualified, there is a seventeen-day Navigator Bombardier Course to teach the basics of radar bombing. Emphasis is on the equipment in the FB-111A.

— The crewmembers who are qualified in one of the Tactical Air Command's F-111 aircraft undergo a course of Difference Training which concentrates on the systems, crew duties, and operations peculiar to the FB-111 and the mission of the Strategic Air Command.

— Individuals who return to the aircraft after other assignments receive Requalification Training tailored to their time away from the FB-111 and their individual needs.

— There is a Senior Staff Officers' Qualification Course designed to qualify senior officers assigned to either of the FB-111 wings to fly with an instructor pilot.

— Pilots and navigators identified by their Wing for instructor duty attend the Central Flight Instructor Course (CFIC) which involves two weeks of ground training for pilots and navigators and a third week of flight training for only the pilots.

— The longest course is that for Initial Qualification Training and lasts a total of 113 training days and results in crews qualified to perform SAC's mission.

A new class starts the Initial Qualification

A CCTS flight line instructor, Maj Tom Mullen, briefs student crew Captains Steve Barth and Dave Van Mullem prior to their first solo flight.

Course (IQC) every six weeks. The student pilot and navigator are crewed together from the beginning, and will remain as an integral crew for all of their training. There are two crews per class and the base to which the crew is to be assigned is identified from the start of training — this helps the instructors if they need to identify a procedural difference between the two wings during training.

Academic training starts the IQC program and lasts for 47 training days. During this period of time, the student crew does not fly the aircraft, but rather learns how the FB-111's systems function and gains experience in operation of the controls in the simulators. Academic instruction is provided by several different individuals and culminates in a comprehensive test of systems knowledge.

The old "platform instructor" who specialized in only one area is gone — replaced by courseware designed through Instructional Systems Development (AFM 50-2 calls it Instructional Systems Engineering and Systems Approach) which allows any of the instructors to instruct in many different areas related to their specialty. All of the basics have been developed into either videotapes or sound-slide programs. However, there is always an instructor monitor around to answer the questions inevitably not covered by the programs. After five years of work, the entire range of tasks, knowledge, skills, and attitudes required to successfully fly the FB-111A have been analyzed and criteria established specifying desired performance to prove capabilities. All student crews are trained to the Qualified Level in accordance with SACM 60-4, Standardization and Evaluation, and must meet the same safety and performance levels of a combat crew in the Bomb Squadrons.

Coupled with the incorporation of ISD techniques has been the development of a Learning Center with eight learning carrells containing videotape players, color televisions, and having the capability to show sound-slide programs. Included in the Learning Center are three Cockpit Trainers, two mock-ups and an

Lt Col George W. Larson, Jr., CCTS commander, and Lt Col Daniel K. Harmon, operations officer, enjoy the satisfactory completion of a student crew's check ride.

actual FB-111 crew capsule. These devices are used for learning switch/control locations and checklist procedures (the "blindfold cockpit check"). All videotapes and sound-slide programs are produced by the 4235th Strategic Training Squadron at Carswell AFB, TX, using subject matter experts (SMEs) from both FB-111 wings to write the actual program scripts.

There are two new mock-ups of the FB-111 cockpit which include tables or writing areas to take notes. They are used in the classroom when the student crews first learn the use of cockpit controls and aircraft systems. While the instructor is presenting the block of training on the screen in front of the class, the students will be able to look and see the relative position of the control unit in the cockpit.

The mission simulator has full motion around three axes and a visual simulation attachment has been added in the last year. The simulator can effectively give the sensations of actual flight. The "box" also duplicates the constraints and interior of the FB-111 capsule, thus providing training similar to that which could be accomplished in the aircraft. The major benefits in the use of the WST revolve around the ability to realistically simulate Emergency War Order (EWO) missions and inflight emergency situations which could not be duplicated in the aircraft without risking crews and equipment. Specific tasks can be practiced again and again to achieve proficiency.

A relatively new attachment of the Weapon System Trainer is the visual attachment which is in the process of Initial Test and Evaluation. This system addition has displayed the potential to accomplish formation, air refueling, and low-level training which has been previously only possible in the aircraft. The visual attachment has enhanced the realism of the simulator as a training device. An extra benefit of the visual attachment is the ability to replay on the screens in the simulator either what was just seen during a maneuver, or to project a miniature aircraft duplicating the maneuvers just performed by the simulator crew.

In addition to the two full-motion simulators, an Avionics Simulator or Bomb-Nav Trainer (BNT) is available for training in the use of the navigator position's equipment. This simulator duplicates only the right half of the capsule, but effectively shows equipment location and operation. As the navigator must also be a copilot, bombardier, and electronic warfare officer in

A crew chief prepares an FB-111A for its next mission.

Instructors from Pease AFB, 1Lt Ed Dixon and Maj Don Hyman, review a program while undergoing CFIC training.

this aircraft, the Instructor and student navigators spend an additional 28 hours in this trainer over and above the time in the full-mission simulator. We also have a T-36 Trainer for instruction in Short Range Attack Missile (SRAM) procedures.

The first 15 simulator sessions revolve around peacetime operations and acquiring basic systems knowledge. This phase culminates with an Initial Qualification Check. The crew is evaluated in the WST and the pilot also receives an inflight evaluation. CCTS has two crews whose major responsibility is to evaluate all the student crews to insure required systems knowledge and adherence to safe procedures. Successful completion of this check allows the student to fly without instructors in the aircraft ("solo") and starts them on the Emergency War Order (EWO) phase of training.

During the EWO phase, the students fly peacetime training sorties in the aircraft, while training in the simulator for wartime tasks. Student flights are monitored by an instructor in a radio-equipped vehicle. It is his responsibility to insure that the student crew can safely accomplish their training sortie. There are five simulator sessions devoted to EWO training. At the end of them, the student crew will receive a second evaluation, a Mission Qualification Check, to insure that they are proficient in air refueling, low-level navigation, partial systems operation, bombing, terrain following radar, electronic counter-measures, Short Range Attack Missiles, and SAC Tactical Doctrine. The pilot receives an additional flight check to insure safe procedures and ability to fly the aircraft.

The FB-111 has the capability of automatically flying at a given height, or clearance plane, over the ground using the aircraft's radar systems. This is called Terrain Following. When the ground can be easily seen (VFR) and used as a crosscheck of the system, it is relatively easy to do safely. However, the crews will ultimately be required to fly terrain following when they cannot see the ground: at night or in the weather (IFR). After the MQC check, the crew receives additional class instruction and a simulator session and flight with an instructor involving the proper techniques for this activity. They will finally be qualified in Night/IFR TFR after training in their assigned squadrons

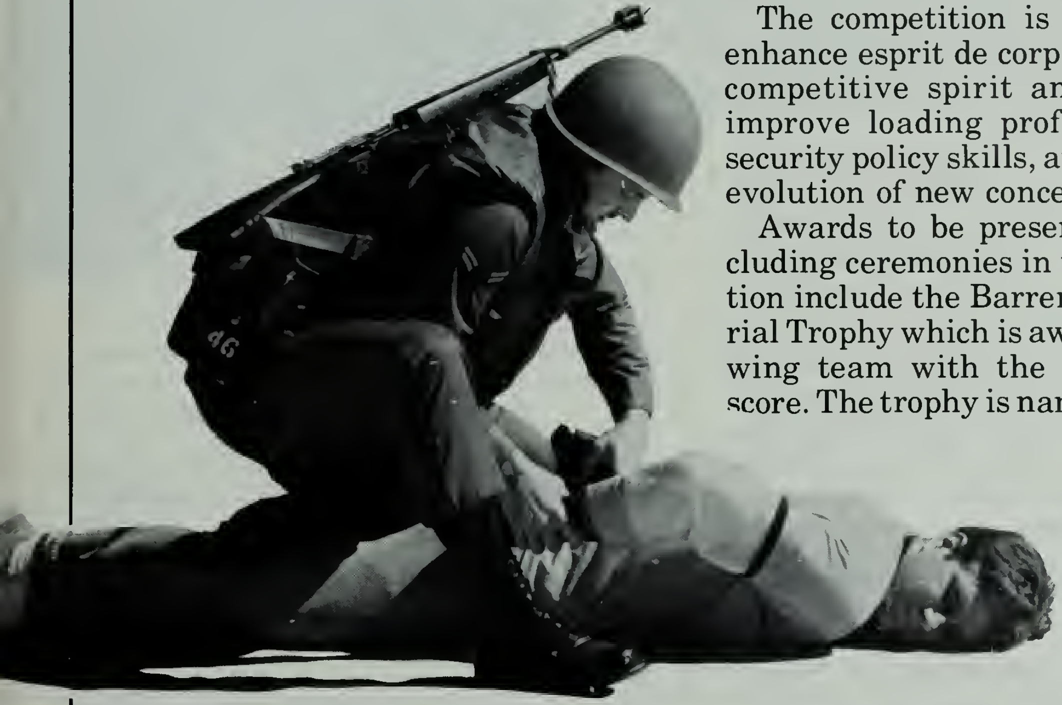
Continued on Page 11

An instructor navigator, Captain Jim Henderson, gives target study to two student navigators prior to their flights.

Giant Sword

1980

The annual SAC Loading competition, GIANT SWORD 80, will be held at Ellsworth AFB, Sept 8-17. SAC's 20 bombardment wings will meet at this South Dakota base and be represented by a competition team composed of a five-person munitions load crew, an aircraft crew chief, a six-person security police element and a team officer and noncommissioned officer.



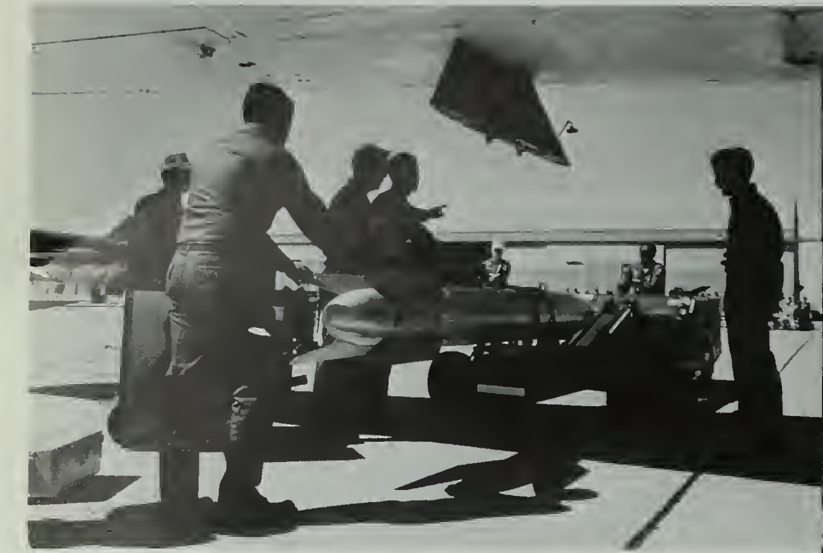
No actual weapons will be loaded, according to Maj Harold H. Henton, SAC project officer. Using training devices only, each munitions crew will be required to upload one or two different classes of weapons: gravity weapons and short range attack missiles. Munitions loading will be accomplished on four types of aircraft — a B-52 D, G and H and an FB-111. Each team will be evaluated on the condition of its equipment, two munitions loadings and by a written test. The maximum possible score for each loading team will be 1,250 points.

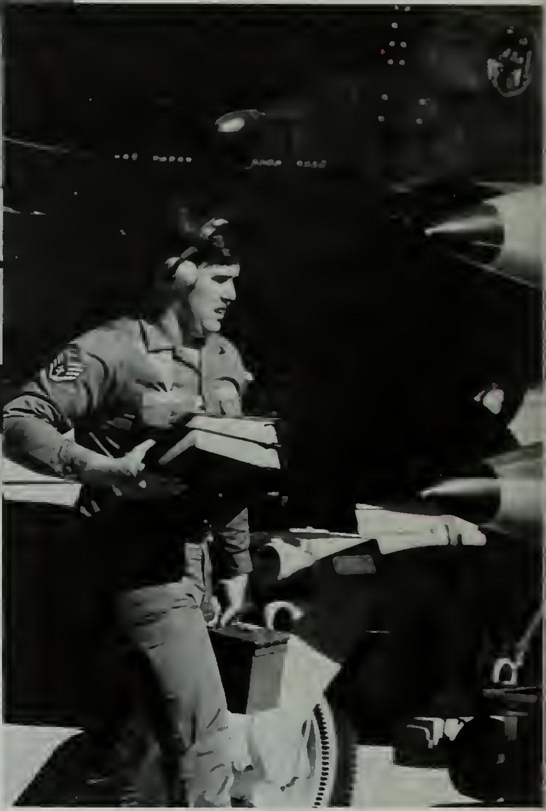
Security police teams will be scored to a maximum of 1,500 points. Realistic security situations involving the protection of alert bomber aircraft and weapons will be staged for each team in addition to a written test and M-16 rifle firing. Also, aircraft crew chiefs will be evaluated on a written test, preload and postload exercises and can earn a maximum of 250 points.

The competition is designed to enhance esprit de corps, promote a competitive spirit among units, improve loading proficiency and security policy skills, and aid in the evolution of new concepts.

Awards to be presented at concluding ceremonies in the competition include the Barrentine Memorial Trophy which is awarded to the wing team with the best overall score. The trophy is named in honor of CMSgt Wilbur R. Barrentine, a member of SAC from the mid-fifties until his death in 1970.

Also being awarded will be a Best in SAC Loading Competition plaque for permanent retention by the wing and individual awards for the winning team members. In addition, plaques will be awarded to the parent squadrons of the following: best munitions load crew; best security police unit; and best





bomber crew chief. Awards will also be given for winners in individual subcategories.

All munitions loading activities will be open to the public and scores will be posted on the main scoreboard in the competition headquarters, according to SAC's project officer.

Last year's loading competition was a close contest all the way, but Minot won the coveted Barrentine Trophy with a final score of 2790 out of a possible 3000 — truly a fine effort. The Minot team included: MMS — Sgts Michael D. Schiefer and Neil E. Flavell (crew chief), SrAs Kevin J. Fosburgh and Alan R. Foltz, A1Cs Edward G. Pouch and John P. Reymond. SPS — Tsgt Harry E. Weaver, SSgts David L. Ingold and Melvin J. Lankford, SrAs Joseph F. Stambaugh and Charles L. Adams, and A1C John E. Browne, Jr.

This year the 5th BMW will have its work cut out for it in trying to be a repeat winner of the top trophy. The Giant Sword competition brings together SAC's finest munition people, security police and crew chiefs for a hard week's competition — the best of luck to all.

BARRENTINE BEST

1979	5 BMW	Minot
1978	43 SW	Andersen
1977	93 BMW	Castle
1976	7 BMW	Carswell
1975	93 BMW	Castle
1974	93 BMW	Castle
1960	384 BMW	Little Rock
1959		
1958	29 Aviation Depot Sq	Homestead

BEST SECURITY POLICE UNIT

1979	97 SPS	Blytheville
1978	44 SPS	Ellsworth
1977	379 SPS	Wurtsmith
1976	97 SPS	Blytheville
1975	42 SPS	Loring

BEST AIRCRAFT CREW CHIEF

1979	92 OMS	SSgt Thomas A. Stastny
1978	416 OMS	SSgt Donald R. Billings, Jr.
1977	5 OMS	SrA Keith D. Rappleyea
1976	379 OMS	SSgt Ted Scoggins
1975	28 OMS	Sgt Jeff Redder

TRAINING THE BEST

Continued from Page 7

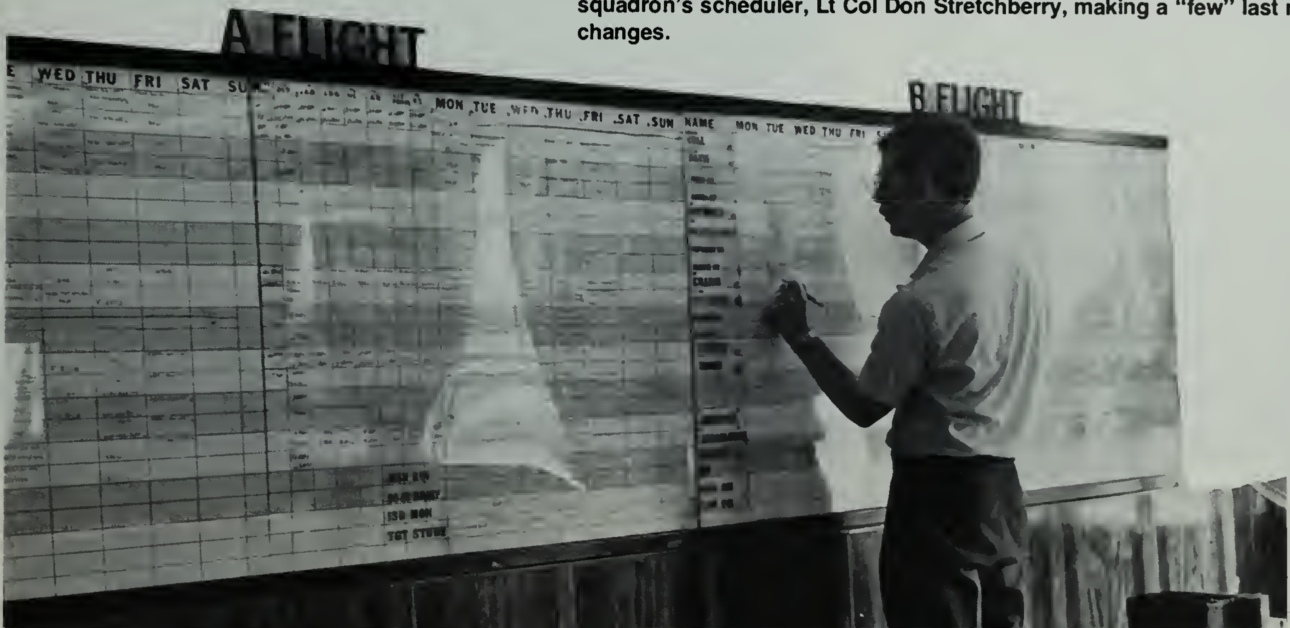
Three FB-111As move in on their tanker during a rendezvous.

as combat crews.

The 4007th CCTS has been fortunate in having the 210th Field Training Detachment (ATC) located in the same building. Instructors have been able to use the same mock-ups and training devices used in training the FB-111 maintenance personnel. Also, we have relied upon the FTD instructors as a ready source of systems expertise.

The instructors picked for duty with the 4007th CCTS are selected from the best in their respective wings. Prior to assignment with the squadron, each individual is screened by the CCTS Squadron Commander and his staff. The safety record of CCTS has been outstanding as a result of this careful scrutiny. Long hours are put in by the instructors, who must keep up their own flying and training after their responsibilities to the students have been fulfilled. On top of this, six instructor crews, including the Commander of the 4007th, maintain EWO currency and are certified to fly the 380th Bomb Wing's Operational Readiness Inspection mission.

The 4007th CCTS is proud of its people, past and present, and the effectiveness of their training. Feeling that they are training the best in SAC, it does not matter which FB-111A wing wins any of the various competitions each year: the crews that won the awards received their training with the 4007th Combat Crew Training Squadron.


A FLIGHT
B FLIGHT
WED THU FRI SAT SU
MON TUE WED THU FRI SAT SUN NAME
MON TUE WED THU FRI

The busiest place in the squadron, the operations office, often finds the squadron's scheduler, Lt Col Don Stretchberry, making a "few" last minute changes.

THE KC-10

EXTEN

Major Wayne Brunz,
Hq SAC/XPHV

At the end of this year, SAC's new tanker, designated the KC-10 will touch down at Barksdale Air Force Base when SAC takes delivery of the first aircraft. The primary requirement for the KC-10 stems from the need to achieve worldwide mobility of U. S. General Purpose Forces, independent of forward basing. This capability to project U. S. forces is an essential factor in supporting U. S. policy goals as the need arises.

The official name for the KC-10 is the "EXTENDER." The name was chosen because it describes the jumbo tanker's strategic advantage of being able to carry out its aerial refueling and cargo carrying missions without forward basing. The plane thus "extends" the mobility of U. S. forces in contingency operations. Assembly of the first KC-10 began in June 1979 at the McDonnell Douglas Long Beach, California, facility; and the rollout ceremony was held on April 16, 1980.

The KC-10 is powered by three General Electric CF6-50C2 high bypass-ratio turbofan engines, each generating 52,500 pounds of takeoff thrust. The new tanker is 182 feet, 3 inches in length and has a wingspan of 165 feet, 4 inches and a tail height of 58 feet, 1 inch. Maximum gross takeoff weight of the KC-10 is 590,000 pounds. Design fuel capacity is 356,065 pounds, including a maximum of 238,565 pounds in the standard wing tankage and a maximum of 117,500 pounds stored in seven fuel cells below the main deck.

In addition to the increased gross weight and the fully manageable integrated fuel system, KC-10 modifications to the commercial DC-10-30CF (convertible freighter) include: elimination of upper deck windows and lower deck cargo doors, provisions for additional crew, a flexible capa-

KC-10 Boom operator station

DER

bility for accommodating additional support personnel, receptacle for in-flight refueling of the KC-10 itself, military avionics, pilot director lights for receiver aircraft, supplemental fuselage fuel tanks, modernized aerial refueling operator station, hose reel with drogue for refueling Navy and other probe-equipped aircraft, advanced aerial refueling boom, and an improved cargo handling system.

The advanced aerial refueling boom features larger disconnect and control envelopes, independent disconnect capability, increased fuel-flow rates (1500GPM), an active control system with digital fly-by-wire controls, automatic load alleviation, position rate sensing to assure disconnect within control limits, precision hand controllers with low force requirements, and operator-selectable disconnect limits. Additionally, the KC-10 has a hose reel system and the new capability to change from hose to boom refueling and vice versa, while in flight.

The boom operator's station in the KC-10, located aft of the rearward lower fuselage fuel tanks, features improvements in comfort, viewing capability, and environment. Instead of assuming the prone position required in current tankers, the boom operator sits in an aft-facing crew seat. Station equipment includes convenient refueling controls, a wide viewing window facing the aft "customer" position, and additional periscopic viewing arrangements for traffic management. Accessible from the upper deck, the station is pressurized and has independent temperature control, a quiet environment, and an arrangement suited for both training and operational missions. While refueling requires only one operator, two additional seats are provided to accommodate an instructor and an observer.

In an all cargo configuration, the KC-10 accommodates 25 standard 88 × 108-inch cargo pallets in the cabin with aisles down both sides or 27 pallets with a single aisle. To facilitate the handling of cargo, the KC-10 is equipped with powered rollers, powered winch provision for assistance in fore and aft movement of cargo, an extended ball mat area to permit loading of larger items, and cargo pallet couplers which allow palletizing of cargo items too large for a single pallet. These features, plus the large 102 by 140-inch cargo door which swings upward on the left side of the forward fuselage for loading and unloading, give the KC-10 the capability to transport a significant portion of the tactical support equipment of fighter squadrons.

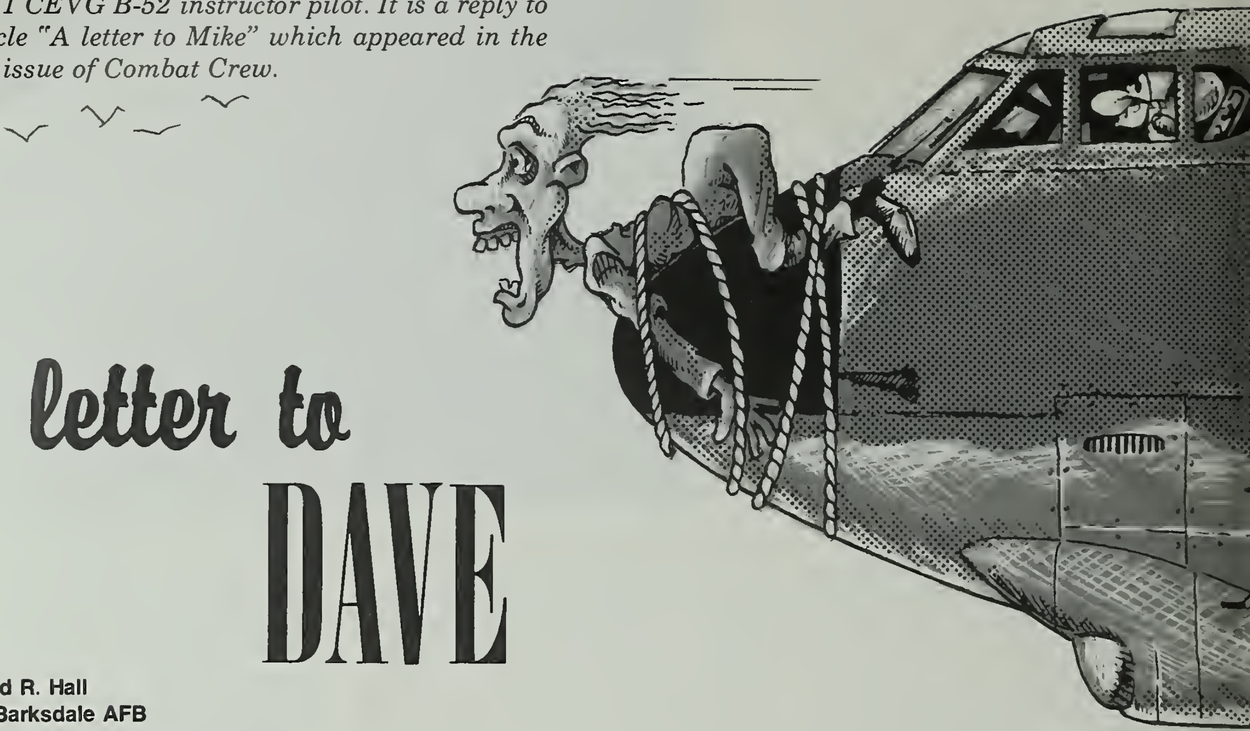
Several configurations exist for personnel accommodations. One arrangement is for the crew of five, plus six seats for additional crew and four bunks for crew rest, with an environmental curtain between bunks and the cargo net. The same area also has space for the installation of 14 more seats for support personnel.

Although all eight of the KC-10 upper deck passenger doors are installed as standard, three are deactivated. Normal entry and exit are through the two forward passenger doors on each side, and the aft right-hand door is available as a ground emergency exit for personnel in the boom operator's station.

The advanced, roomy cockpit easily accommodates the three — man flight crew and the boom operator/loadmaster. Avionic systems in the cockpit include control and display units designed to improve crew efficiency and to reduce crew workload.

The KC-10 fulfills the United States' need to achieve global mobility independent of forward bases. It takes full advantage of the inherent capability of the commercial DC-10, retains some 88 percent commonality with the commercial aircraft, and maximizes the per dollar fuel and cargo payload movement essential to national defense.

EDITOR'S NOTE: *This is another article by Capt Hall, A 1 CEVG B-52 instructor pilot. It is a reply to his article "A letter to Mike" which appeared in the Feb. 80 issue of Combat Crew.*



a letter to DAVE

Capt David R. Hall
1 CEVG, Barksdale AFB

Dear Dave,

Appreciated your letter a few months back. I passed the checkride in April — not "Highly Qualified," but a good flight regardless. Since then I've picked up a good crew with a real strong navigator, and we've been through all the EWO and ORI certifications. The BUY NONE hit halfway through our second alert tour, so this is the first chance I have had to get back to you.

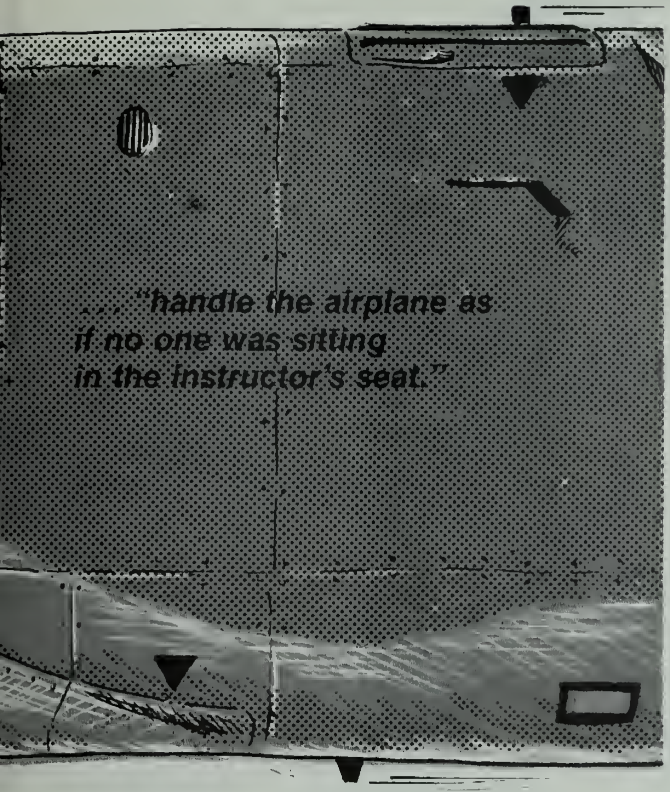
What I have done is sit down with a number of crew members from both airplanes and put together a list of our pet peeves — things evaluators do that makes life difficult. It has been interesting compiling the list because some of the things you told me about in your letter last February are going to come back to haunt you.

You wrote of attitudes and how checkrides are not a personal affront, but rather a quality control on our training program. I agree. Attitudes and mutual respect are the most important considerations during the evaluation process. Please don't forget I have earned my wings too and work just as hard at my job as you do at yours. I, too, am concerned about proficiency, safety, and reliability in this unit and our command. I use my training time wisely, and I have my act together. So come fly with me, and take your best shot, but don't play Moses coming off the mountain with ten tablets. Don't let your position go to your head.

Meeting at Base Ops

Be on time! Scheduled check or no-notice, it makes no difference. You know my showtime, so be there. Introduce yourself, add the appropriate information to the flight orders, then back off. First, I am going to get the weather briefing and file the flight plan, and then we can talk about the mission. I will try to be enthusiastic, but I need you to show a little interest as well. I'll brief you on what I consider important, and I have given the briefing some forethought. Please don't cut me off and say you've heard it all before or that you've flown this route dozens of times. When you brief me, tailor your presentation to the crew. A crew with four years experience does not need the same briefing as one that has never flown a no-notice before. If I make a mistake with the mission requirements, tell me in Base Ops. Neither of us needs to fly a subsequent check because I forgot to fly a nonprecision approach or did not realize a practice separation was part of my annual requirements. Be your self at Base Operations. Neither of us can afford to be putting on an act.

While we are at it, how about finding a couple of friends to go with you. I don't need you today,



. . . "handle the airplane as if no one was sitting in the instructor's seat."

another evaluator Thursday, and a third next week flying with my crew. Do yourself a favor and get it all done at once. I like to fly solo too!

Preflight – Please make sure you have your personal equipment with you. We can always call for an extra chute or survival kit when they are not prepositioned, but things like your helmet are your own responsibility, not mine. Speaking of equipment, how about an extra hand tossing books, lunches, and cold weather gear off the bus and onto the aircraft. Once we get everything on the machine, find something to do for a few minutes. I don't care what. Talk to the crew chief or the bus driver and tell them they are doing a good job, whatever you want, but give me a couple of minutes with my crew. I can get the equipment stowed, the aircraft cleaned up, and the crew can get any last minute problems resolved. You won't miss anything.

Inflight –

Evaluate, don't instruct! If you switch back and forth, then I will never know which mode you are in.

Your letter told me to "handle the airplane as if no one was sitting in the instructor's seat." I'd love to, but that is difficult with the evaluator sitting in my lap or violating my airspace. I realize that flight instruments are difficult to see in the B-52G/H from the IP's seat and that the IN's and DI's position are not the most comfortable. However, few things are so critical that the evaluator's shadow must constantly fall across my shoulder. I know you need to take notes, but use a little finesse. Be discreet when you can, and keep your notes covered when you don't need them. If you need my books or associated directives, ask for them. It is distracting when you reach around behind my seat to grab a slip stick or Dash 1.

If you intervene, use a little tact and discretion here also. Give me every possible chance to catch the error or research the broken piece of equipment myself. Sure, when the problem hits your minimums then step in and salvage the situation, but be calm about it. Maybe it is you, the evaluator, who made the mistake.

Every once in awhile an evaluator induces malfunctions "just to see how the crew will handle it." Let the piece of equipment fail on its own. I don't need you to turn off autopilots and pull circuit breakers. You do not have the authority to induce malfunctions so I should not have to include you in my cross check.

Sometimes you need to get in one of the seats. For whatever reason you need to be there, I expect you to be the best crewmember you can. That means backing up airspeed and altitude calls and pushing checklists. If you have other

PUNT
Better way, shmetter way ......SO SHOW ME!

ideas about your duties while in the seat, then you had better brief me back in Base Ops long before we get on the bus.

While you are in the seat, sometimes you want to sneak an extra pattern and landing for yourself. Both of us need to discuss it during mission planning and then be flexible in the air. Some evaluatees have no objections and want to minimize their exposure. Others will object to your taking their flying time. Whatever you decide, beware the credibility gap if you can't hold your airspeed on final either.

Postflight -

I'll try not to ask you, "How did I do?" as soon as we get off the bus, because I know you have to "run it through the maze." However, If you do decide to bust me, I sure would like to be the first to know. Only one thing is worse than an irate squadron commander, and that is my wife finding out about my ILS while in the commissary. And you know it has happened.

Critique

The critique is your show and you will run it to fit your own style. That is fine, but let me give you a couple of hints.

First, on grading, I need an impartial, informed evaluator. I want the same treatment for the squadron fair-haired boy and the guy who busted three check rides last year. What happened last week has no bearing on performance today. Be knowledgeable about SACR 60-4 and the grading volumes. An evaluator at Base X "hooked" several crewmembers in technique subareas because they didn't use *his* techniques. Technique grades are for how I smoothly yank and bank the airplane, not for grading against his standards. Sure, CEVG caught him, but that was long after the damage was done.

While we are speaking on "hooks" and "busts", use a little discretion on automatically taking three or four crewmembers on one crew for the same offense. It isn't always called for. Calls from the unlike specialty aren't always too pure either. This isn't a game of trying to see who can do whom from which seat. If the evaluator can not identify the complete problem, i.e., the circumstances leading up to the discrepancy, show the evaluatee why the error occurred, and show him how to recover, then the evaluator hasn't much business making the

"Allright! Which one of you jokers is the evaluator?"

call. For example, I can not see too many circumstances, other than a grossly misread heading, where a pilot evaluator could bust a B-52 nav team for low level navigation.

Second, while conducting the critique, identify procedures or techniques as such. If it is a procedure, provide a page reference and have the reference readily available. An "old head" Lt Col, recently back to the cockpit, told me he did not want to hear anybody else's techniques as long as the ones he used were still working. Say what you want about his attitude, but his time and talents are worth considering.

Chose your words carefully and don't lecture me. I've got wings on my chest too. If we have several visitors in the specialized critique, maybe you and I could handle most of the little "critique items" over a cold one at the Club. I can handle the big items in front of the Commander, but don't embarrass me with every little detail.

When we do go in front of the commander, consider the impact of your words. If I blew it, whereby I fell asleep, didn't have enough sense to page count my checklist, or left the floor grate open; one of the "no brainers" you mentioned in your letter: then let *me* tell the commander. Let me show him I've fixed the problem. If I went sailing through an altitude on climbout from low level, that probably isn't my everyday performance either. Who of us in the command has never thought, "Glad CEVG wasn't onboard today!" When I need corrective training, prescribe it, but make the punishment fit the crime. Present it the way you would like your own failures to be critiqued.

Empathy and mutual respect are still the keys. The evaluator and evaluatee both have a job to do in a small space. You need me to be prepared, forget you are there, and not scare you. I need you to sit back, relax, and enjoy the ride. Neither of us can completely stay out of the other's way, but somehow the two concepts should not be incompatible. By the way, who checks the checkers?

Thanks for the six weeks notice,

Mike

M-X

The ICBM Legacy Continues

Maj David K. Snider
DCS/Plans
Offutt AFB

Certain dates stand as landmarks in the brief history of powered flight. On a December day in 1903, the Wright Brothers broke the chains that had bound men to earth throughout the ages. Twenty-four years later, in the spring of 1927, Lindbergh took off for Paris. A scant two decades after the flight of the 'Spirit of St. Louis," Chuck Yeager broke the sound barrier in the experimental XS-1. Events picked up speed. In February, 1962, John Glenn became the first American to orbit the earth, and, seven years from his pioneering effort, on July 20, 1969, Armstrong and Aldrin stepped onto the surface of the moon. Incredibly, it all came about in less than a normal human lifetime.

Over this short span of time, the military applications of flight rapidly became indispensable to our national defense. The advent of nuclear-equipped long range bombers and intercontinental ballistic missiles (ICBMs) set against a background of shifting balances of international power fostered the concept of strategic deterrence.

The ICBM has been a key element of our strategic forces for nearly twenty years. Although its history has not been so glamorous and well known as that of manned flight, strategic missilery has come a long way in a short time. The evolution from Robert Goddard's small rocket to the MINUTEMAN III, the primary weapon system in our nuclear arsenal today, has been a chronology of quiet success. For example, in 1962, the same year John Glenn made his orbital flight, the first MINUTEMAN I was operationally tested at Vandenberg AFB; and we achieved an Initial Operational Capability (IOC) with the MINUTEMAN I at Malmstrom AFB, MT. Only a year before, in

The Missile-X transporter will be similar in size and weight to this vehicle, now undergoing testing at Jackass Flats, Nevada. Small pickup and people emphasize actual size of the vehicle.

February, 1961, the very first MINUTEMAN I research and development launch had been conducted at Cape Canaveral. Proving itself to be a remarkable "grafting stock" the MINUTEMAN I provided the framework for our currently deployed systems, MINUTEMAN II (IOC-1964) and MINUTEMAN III (IOC-1970). The last MINUTEMAN III was deployed in 1975, only seventeen years after the original MINUTEMAN research and development contracts were awarded. But there is another side of the story.

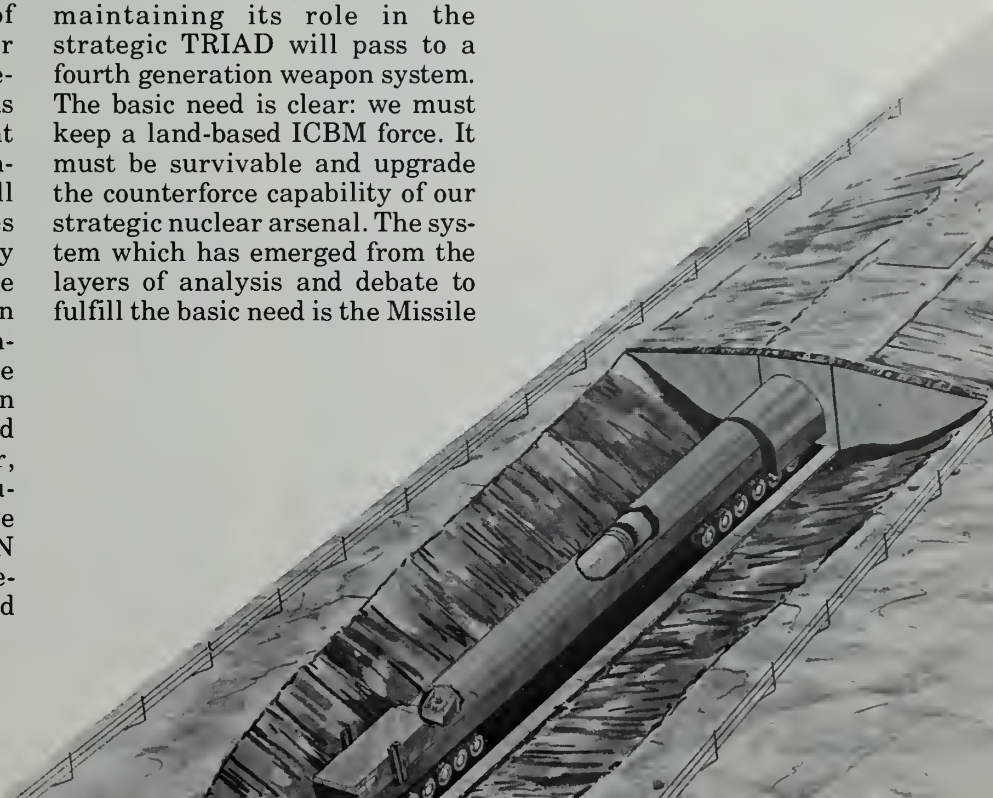
It is not fiction that the leaders of the Soviet Union, as Marx suggested, regard force as the "midwife of change." This includes nuclear force. The Soviets have understood the advantages of land-based ICBM systems for many years. Their aggressive research and development programs and extensive ICBM deployment since the mid-sixties provide convincing testimony to this. For well over a decade, Soviet expenditures on strategic forces have nearly doubled ours. Their strategic force deployments and modernization programs continue at full momentum. Since we "capped" the number of our ICBM launchers in 1967, the Soviet Union has fielded several generations of larger, MIRVed, and increasingly accurate missile systems. Since we emplaced our last MINUTEMAN III in 1975, the Russians have deployed over 500 new or improved ICBMs.

The numbers and capabilities of the expanding Soviet ICBM systems add up to a growing discrepancy between what we can do as opposed to what they can do. A dangerous inequality in destructive capability between Soviet ICBM systems and our own is developing more quickly than we expected. Our fixed point MINUTEMAN force is vulnerable. Its degree of survivability during a full scale nuclear surprise attack is rapidly becoming unacceptable. Survivability and retaliatory capability are the touchstones of our analysis of a nuclear exchange and are the essential elements of strategic deterrence.

So the ICBM legacy continues. The mantle of responsibility for maintaining its role in the strategic TRIAD will pass to a fourth generation weapon system. The basic need is clear: we must keep a land-based ICBM force. It must be survivable and upgrade the counterforce capability of our strategic nuclear arsenal. The system which has emerged from the layers of analysis and debate to fulfill the basic need is the Missile Experimental, or M-X, to be deployed in a horizontal shelter multiple protective structure (shortened to horizontal shelter) basing mode. The missile entered Full Scale Engineering Development (FSED) in June 1979 and the horizontal shelter basing system in September 1979. The genesis of M-X and how to base it, however, antedates these decision points considerably.

Continued on Page 30

Missile-X transporter parked at horizontal shelter entrance ready to remove or emplace a missile or mass simulator.



CFIC Corner

Capt William J. Betz
Carswell AFB

Maj John R. Moock
Central Flight Instructor Course
Castle AFB

Ya Gotta Have Faith

Some of you book worms may have noticed that IP supervision is no longer required for practicing flaps-up approaches, according to SACM 51-52, Vol VI. Consequently, most of you will be be practicing approaches you have seldom seen, let alone accomplished. Approaching this set of circumstances with a "Ya gotta have faith" attitude, with little training or preparation, could easily be construed as detrimental to adding any clusters to your longevity ribbon.

If flaps-up approaches can be dangerous, why do we do them? This is a legitimate question. There are any number of emergency situations which could dictate a flaps-up approach and landing. The most obvious situation is when you can't get the damn things down for one reason or another.

Another situation might be complete failure of the rudder/elevator systems. In this situation the high angle of attack on final during a flaps-up approach would help solve the flaring problem normally incurred with the elevator inoperative. During severe asymmetrical conditions, three or four engines inoperative on the same side, the higher airspeeds and reduced thrust requirements for a flaps-up approach make controlling the old Buff a lot easier. This has a very positive effect on the number of clusters you add to your longevity ribbon. I'm sure you'll agree that you don't want to get stuck in any of the above situations and end up flying a "no flapper" for the first or second time in your life. You will want to be very familiar with flaps-up procedures and techniques because you'll probably have your hands full with the other emergency. Okay, "let's do 'em".

What is different about a flaps-up approach that we need to know? The most obvious thing is the higher than normal angle of attack. This is true of all phases of flight other than the actual touchdown. At touchdown, the attitude is virtually the same as when the flaps are down. Think about it for a second. We touch down, slightly aft gear first, flaps up or down. This fact can be very important when trying to determine where to position your seat. We'll get into that in detail a little later.

This high angle of attack also causes the picture outside the aircraft to appear different during all phases of flight other than the landing attitude. Another potentially serious problem associated with angle of attack is that increasing back pressure to get back on altitude, when low on airspeed, can cause very high sink rates. At low altitudes the average pilot will find great difficulty in recovering the aircraft in this situation.

Another characteristic of the flaps-up approach and landing that is different from flaps-down is the much higher airspeeds associated with "no flappers". This higher airspeed can be very beneficial when we think of increased airflow across the rudder to help us control an asymmetric situation, but at the same time it can have extremely detrimental effects on your brake energy limits and stopping distance. A careful review of your performance manual will reveal that the normal "brake energy limits" can easily be exceeded on almost any flaps-up full stop landing. While you're looking at the performance manual, why don't you look at what kind of effect a "no flapper" has on your planned landing ground run on a wet runway. You'll see it's virtually impossible to stop the critter if your drag chute fails. Guess when it will fail? As you can see there are some differences to a flaps-up approach and landing of which you should be aware.

How do we fly the approach? The tech order goes into procedures, airspeeds, etc., in great detail, so we'll just touch on the procedures. In gusty wind conditions we increase approach speed by the full gust factor. For a crosswind we apply 70% of flaps-down crosswind crab setting. We do not reduce power until aft gear touchdown, and we hold the airbrakes until the nose gear contacts the runway. We deploy the chute at 135 knots and apply the brakes at touchdown or maximum brake application speed. Airbrake position has no effect on approach speed. So much for the highlights. Be sure to review those procedures outlined in the tech order.

What techniques would help us when practicing "no flappers"? The first technique involves seat placement. There are two schools of thought on where to place your seat; either move it up or leave it close to normal. There are advantages and disadvantages to each. The higher than normal angle of attack associated with a flaps-up approach creates a visual problem for the pilot. As stated before, the visual picture is very different for all phases of flight other then the landing attitude.

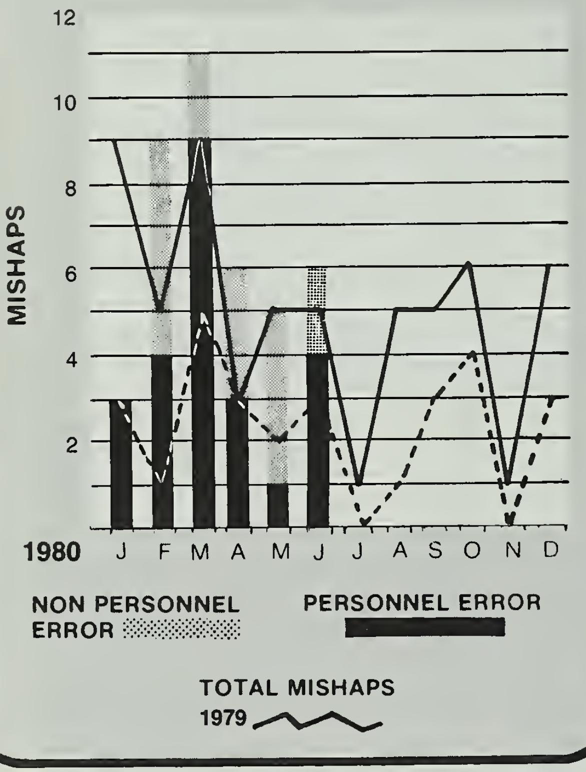
Some pilots move their seat to the full up position, or close to it, in order to see outside the aircraft a little better. This does improve the picture; however, the different seat position can make it difficult to see some of the instruments. Another disadvantage is that the pilot's position in relation to the flight controls is quite different, and this can make it difficult to get full control travel. A third drawback to moving the seat up is that the landing attitude picture will look much different. For these reasons most pilots like to leave their seat close to their normal position. They are willing to sacrifice the picture on final for the picture during landing attitude. With the seat in normal position the instruments are easier to read, and the pilot's position in relation to the control column and rudder pedals is normal. If you have any doubts, try an approach both ways and see which seat position you like. Keep in mind that we are practicing the approach to make a landing, in which case the picture during landing attitude is very important.

Accurate airspeed control is vital to the good flaps-up approach. You will find, with the flaps-up, airspeed is difficult to bleed off; so you don't want to get high on airspeed. You also don't want to get low. If the pilot gets low on airspeed and low on altitude and applies back pressure prior to increasing thrust, he will find it difficult to accelerate due to the high angle of attack and the fact that he is behind the power curve. This is especially true for you "D" model troops. The above situation can also lead to high sink rates as previously discussed. Remember, control altitude with power, and airspeed with pitch. When shooting a "no flapper", altitude is sometimes difficult to judge when close to the ground (less than 100'). Crosscheck your radar altimeter to help judge height. If you happen to touch down, don't get excited, simply maintain your attitude and add power; the aircraft will go around nicely.

As you can see a "no flapper" is quite a bit different from a normal approach and landing. It will require some practice and a lot of understanding and knowledge. Approaching your first flaps-up approach with simply a "Ya gotta have faith" attitude can be detrimental to your health, and the number of clusters you add to your longevity ribbon. Fly the aircraft.

Missile Mishap Report

DOD CLASS A, B and C



LCF BATTERY CHARGER FAILURE

A facilities maintenance team was dispatched to troubleshoot a launch control center emergency air conditioning unit. They found only 4.5 volts DC available from emergency batteries. Output No. 1 of the battery charger was 4.5 VDC and 37.0 VDC on output No. 2. It was determined that 16 batteries required removal and replacement along with the battery charger. A time compliance technical order will add a voltage monitor meter to the battery charger which will be completed by 1 September 1980. This will allow a method to monitor the battery charger output and preclude similar mishaps.

TRAINING TACIT WARRIORS

Continued from Page 3

— Monthly MPT sessions which allow crew members an opportunity to simulate combat conditions.

— Periodic emergency action exercises and weapon system verification.

Missile training must, in the final analysis, be a dynamic, essential part of crew duty, insuring the missile crew force maintains the proficiency required to conduct safe and secure daily operations and accomplish necessary emergency war order procedures in the event of nuclear war.

To insure the training remains dynamic, it is continually subject to scrutiny by the instructional systems manager (ISM) at each wing, by the 4315th CCTS Curriculum Management Branch program managers and instructional technologists, by the 3901st SMES, and by the SAC IG.

Changes to the training programs keep the training in tune with the times. Numerous changes and refinements are presently in work or are being staffed to improve training effectiveness.

The 4315th CCTS and operational units are currently converting training programs to meet new training standards developed jointly by 3901st SMES, 4315 CCTS, and the operational units. These training standards are called Comprehensive Performance Objectives (CPOs), and provide explicit guidance as to exactly what is expected of a crew member for each task to be performed. CPO implementation allows for an objective, closely defined and controlled observation of an individual's learning. The 3901st SMES also uses these CPOs to develop scenarios for evaluating crew members. Thus, the CPOs serve both instructional and evaluation purposes.

New training and evaluation standards, centered around the philosophy of "put the reentry vehicle on the target," are insuring that both training and evaluation parameters become more EWO oriented.

The Air Staff recently approved the requirement for new, modernized TITAN II MPTs. These new trainers will vastly improve the training capability for the TITAN II weapon system.

The SAC missile combat crew force continues to maintain a high state of proficiency and readiness, second to none. Dedicated professionals employing sound training programs are responsible for this strong deterrent posture.

Behind a concrete door slammed shut, no starlit skies of night,
No sun-bleached clouds in azure sky, in which to dance in flight.
But certain as the rising sun, these tacit warriors seldom see,
They're ever grimly ready, for someone has to be.

Point of View

Major John R. Lockhart
AFIT/EWI, FAA Fort Worth

The RNAV article in February 1980 spread the word on the positive aspects and benefits of the RNAV concept. Several times the benefits of RNAV routes to the air traffic controller were emphasized. In many cases, an RNAV route does take an aircraft away from heavily traveled routes and makes providing separation easier for the controller, but not always.

We should note some other factors in the air traffic controller's game plan. The article indicated that RNAV has given enroute safety a shot in the arm. Spreading out aircraft instead of concentrating them on airways does make it less likely that two of them will get together — if there were no system of positive separation. The controller providing that separation has several tools available. The most basic is knowing an aircraft's position in reference to known routes and points and knowing which routes conflict and at what point. For example, let's assume Buff 11 will be over the ABI VORTAC northbound at 0245Z and Tank 22 will be over ABI westbound at 0255Z; that's separation. But if one of the airplanes is on an RNAV route, the information is not readily usable. Tank 22 might be at the ABI 120/023 northwestbound at 0251Z. Is that separation? The controller must check further to insure that separation will exist. The controller knows that an aircraft on a particular airway will be clear of a MOA and may proceed unrestricted. But, is the requested RNAV route clear of it? Again, the controller must check further to insure separation. The same process goes for sector boundaries, SIDs, STARs, ATCAAs, ALTRVs, or some special activity that may be ongoing.

The airspace between airways is being used increasingly. If approved, the RNAV route is entered into the computer as an amended route of flight. But depending on circumstances, an RNAV route may complicate the traffic situation.

The flexibility of RNAV will make contributions to fuel savings and traffic handling. But in many cases, use of standard routings may be the safest way to go. As more aircraft get RNAV capability, expect to see more RNAV procedures published which will provide more efficient routings.

Request RNAV when it will significantly help. Expect it to be approved if it fits.

LIGHTNING CAN BE FRIGHTENING

Lt Col Robert J. Hough
320 BMW, Mather AFB

A B-52 crew encountered a very frightening experience returning home from a routine SAC training mission. About 100 miles from home station they called for current weather information as they were expecting to penetrate immediately. The weather observer gave them the information—the forecaster was busy.

There were thunderstorms in the area but well north of the crew's intended route. Center directed them to hold. The crew contacted the command post and confirmed they had received weather. The command post informed them of a MET watch for low level wind shear. However, unknown to the crew was a MET watch of 80% probability of lightning conditions (POLC) and a MET watch for lightning within 10 NM of home station. These MET watches were being recorded in the weather station at the same time the crew called for weather.

The crew held for nearly 15 minutes before they were cleared for the published approach. At about 18,000 feet, they encountered moderate turbulence and were then vectored for an enroute penetration. Light ice buildup was detected on the windshield wipers and St Elmo's fire danced on the windscreen during the penetration. The radar nav did not detect any significant buildups.

Center cleared the crew to 5000 feet and directed a turn to the northeast. About 30 degrees through the turn, lightning struck the aircraft. There was a bright flash accompanied by a loud bang. The aircraft equipment continued to function and no control difficulties were encountered during the approach and landing. After landing, inspection revealed damage to both wing tips.

Where were mistakes made? Weather was not obtained which covered the unexpected delay. The weather observer is not authorized to give forecasts, so, the weather observation that was 45 minutes old was transmitted and the two existing MET watches were omitted. The command post transmitted one MET watch but did not transmit the other two MET watches. The controller had been told by the crew that they had the weather. The latest MET watch of lightning within 10 NM cloud to ground was significant information that the crew did not receive. Lastly, the crew depended on their radar set for significant weather warning.

Take it from this occurrence, don't depend on radar for warning. Obtain weather for the entire time in the local area and make your penetration by avoiding heavy rain showers if at all possible. It is not a pleasant experience having your aircraft hit with lightning.

WHAT'S POLC?

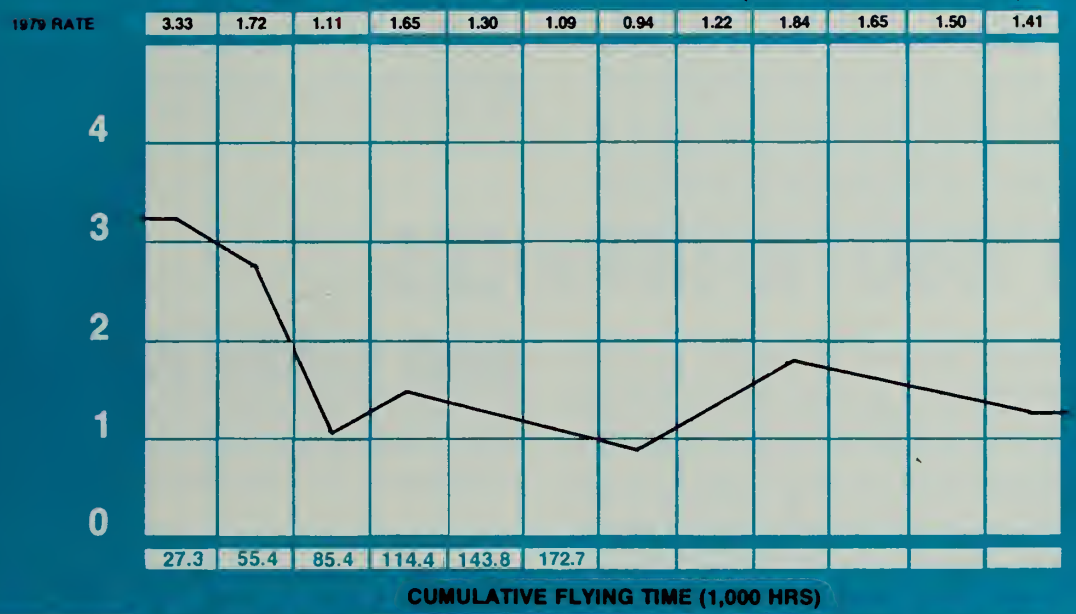
The Probability of Lightning Conditions (POLC) is a program which has been operational in Europe since 1977. It was designed to assist controllers and aircrews to avoid areas in which the potential for lightning strikes and electrostatic discharge was great. POLC only addresses the probability that a crew will encounter favorable conditions for lightning and electrostatic discharges. It does not attempt to define the risk that an aircraft will actually be struck by lightning or experience and electrostatic discharge.

15 AF requested a test of this program in late 1979 and the program began on 1 February. When POLC is greater than or equal to 60 percent, crews and controllers are briefed on the forecasted POLC.

15 AF operational personnel and weather personnel of the 9th Weather Squadron are attempting to determine their capability to advise crews of significant hazards due to lightning and electrostatic discharges, and to determine if these data can be used to effectively reduce the incidence of accidents due to these events. The test is scheduled to be concluded by late July but results and recommendations are not expected to be released until late September or October of this year.

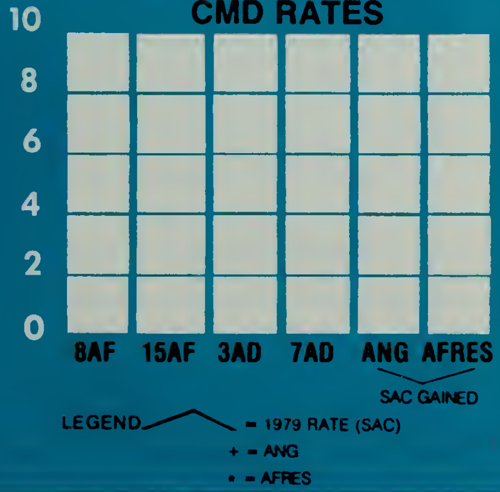
1980 Flying Safety Rate

SAC CLASS A MISHAP RATE (PER 100,000 FLYING HRS)



MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1979	1	0	0	1	0	0	0	1	2	0	0	0
1980	0	0	0	0	0	0						

1980 SUBORDINATE CMD RATES



MISHAP STATUS

BIG INSTRUMENT

AIR TRAFFIC SERVICES and LIMITATIONS

Captain James M. Sullivan
1st Combat Evaluation Group
Barksdale Air Force Base, Louisiana

In our last article, we discussed some responsibilities demanded by the Air Traffic Control System. There are a variety of ATC services which we use every time we fly. Some other services, however, are not used as often as they could be. Furthermore, there are certain limitations which pilots should consider. These additional services and general limitations will be our subject this month.

RAINCHECK

One of the special services which the Federal Aviation Administration provides is "Operation Raincheck," a program designed to familiarize pilots with the ATC system, its functions, and responsibilities. A phone call to an ATC facility is usually all that's required to get the cook's tour and a better understanding of ATC functions. A good place to start is the RAPCON and tower serving your base. If you're fortunate enough to be stationed near an Air Route Traffic Control Center (ARTCC), a visit there could be very enlightening. When traveling by commercial air, you can turn an extended, boring ground layover into an interesting and educational day by visiting the facilities at major traffic centers. From personal experience, visits to O'Hare Tower and the Memphis ARTCC (located near the Memphis airport) are two very interesting tours.

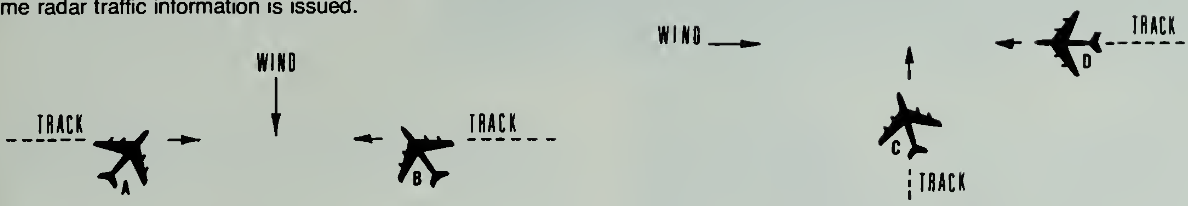
ATIS

A valuable aid to both pilots and controllers is the Automatic Terminal Information Service (ATIS) which provides a continuing recorded broadcast of meteorological and other pertinent arrival and departure data. Pilots should use ATIS as much as possible to reduce control and terminal frequency congestion. For aircrews, the ATIS system permits you to receive weather information at your convenience when cockpit duties permit and to monitor as many repetitions as you desire.

The ATIS broadcast is updated whenever official weather reports are received or when the runway or instrument approach changes. Each ATIS report is identified by a phonetic letter, such as "Information November." Pilots will

FIGURE 1

The examples depicted in the figures below point out the possible error in the position of this traffic when it is necessary for a pilot to apply drift correction to maintain this track. This error could also occur in the event a change in course is made at the time radar traffic information is issued.



(1) In this figure traffic information would be issued to the pilot of aircraft "A" as 12 o'clock. The actual position of the traffic as seen by the pilot of aircraft "A" would be two o'clock. Traffic information issued to aircraft "B" would also be given as 12 o'clock, but in this case, the pilot of "B" would see his traffic at 10 o'clock.

(2) In this figure traffic information would be issued to the pilot of aircraft "C" as two o'clock. The actual position of the traffic as seen by the pilot of aircraft "C" would be three o'clock. Traffic information issued to aircraft "D" would be at an 11 o'clock position. Since it is not necessary for the pilot of aircraft "D" to apply wind correction (crab) to make good his track, the actual position of the traffic issued would be correct. Since the radar controller can only observe aircraft track (course) on his radar display, he must issue traffic advisories accordingly, and pilots should give due consideration to this fact when looking for reported traffic.

notify controllers of receipt of ATIS broadcasts by repeating the alphabetical code and the controller will provide updated information if required. ATIS frequencies may be found in SIDs, the FLIP Supplement, and FLIP Terminal Procedures.

RADAR TRAFFIC INFORMATION SERVICE

We've all heard the arrival controller advise, "Romeo 33, traffic 10 o'clock three miles, southeast bound, type and altitude unknown." The controller is advising us of some aircraft in our vicinity which merits our attention. While this service is routinely provided, radar limitations, traffic volume, etc., may prevent the controller from always providing this service. Additionally, be aware that if you are applying drift to maintain a ground track, the controller sees only your *track* and the clock position contained in the advisory does not account for drift. See Fig 1, reprinted from the Airman's Information Manual (AIM) (46). Should the pilot not see the other aircraft, he may request a vector to avoid the traffic and the controller will comply.

TERMINAL RADAR PROGRAMS

Although Air Force aircraft normally operate under Instrument Flight Rules, mission requirements often bring us into contact with intense VFR traffic in the terminal area. Therefore, it's worth noting what services are available to those VFR aircraft operating in and around your piece of airspace. There are three categories or stages of this service, none of which are mandatory; however, pilots are encouraged to participate in the program. While Stage I provides traffic *advisories* only, Stage II provides *sequencing* for arriving VFR and IFR aircraft. Stage III service further provides *separation* between all participating VFR and IFR aircraft operating in the Terminal Radar Service Area (TRSA) and Air Force aircraft must participate to the maximum extent possible. While it might be desirable for all VFR aircraft to participate, the fact is that they don't. In any case, you the pilot are still responsible to "see and avoid" when operating in VMC.

WEATHER AVOIDANCE

Many pilots rely on the ATC controller to help them avoid severe weather. The April 1980 issue of Aerospace Safety contains an excellent discussion of the capabilities and limitations of ATC controllers and their equipment to provide weather avoidance assistance. Rather than detail the same information here, we will only reiterate that "the controller's primary function is to provide safe separation between aircraft. Any additional service, such as weather avoidance assistance, can only be provided to the extent that it does not derogate the primary function." (AIM, para 511) Enough said.

The ATC functions and services we have discussed are by no means a comprehensive look at the Air Traffic system. However, the more familiar we can become with the services available and their inherent limitations, the better we will understand our role as professional instrument pilots.

PROFESSIONAL PERFORMERS

FLYING CREW

Exceptional airmanship was displayed by SR-71 Crew E-12, 9th SRW, Beale AFB, during an inflight fire emergency and qualifies them as SAC Flying Crew of the Month. During the acceleration phase to Mach 3+, the attitude direction indicator light failed resulting in an air abort. At that time a fuel flow imbalance was observed by the pilot. During the deceleration and level-off at FL 310, a large fire was observed by the crew. The fire engulfed the engine nacelle and spread over the wing and up the vertical tail section. The engine was immediately shut down and the emergency fuel shutoff switch was pulled. The RPM and EGT decreased; however, the fire did not extinguish with the shutdown procedure. The crew rapidly analyzed the situation and increased airspeed to blow out the fire.

Due to the heavy fuel condition and the need for an immediate landing at the nearest suitable alternate, emergency fuel dumping was started. Afterburner on the remaining engine was selected and a descent through weather conditions was made. Upon completion of the fuel dumping, a single engine approach and landing was made at the alternate.

Completion of the emergency landing was compounded by several peculiarities of the SR-71. Visibility from the cockpit is limited by the pressure suit and the aircraft's windscreen. Also, the SR-71 in a single-engine condition requires a combination of bank and rudder to maintain a straight flight path. This type of flying is extremely difficult and this recovery flown in weather conditions required outstanding judgment and airmanship for the successful rescue of a valuable SAC asset.

Maj David M. Peters, SR-71 aircraft commander, and his reconnaissance systems officer (RSO), Capt Edgar J. Bethart, Jr.

MAINTENANCE AIRMAN

TSgt Richard A. Fischer, 19th MMS, Robins AFB, is selected as SAC Maintenance Airman of the Month for his high standards of dedication and devotion to unit and command. As NCOIC of the nuclear munitions maintenance section, he supervised assembly and mating of drop shapes to clip-in assemblies resulting in perfect clip-in system and drop shape performances on every RED FLAG exercise.

Working with AFLC/AFK, he devised a 15-month schedule forecast which allows identification, analysis and elimination of supply and scheduling problems that would otherwise go unidentified. He developed and implemented one of the most comprehensive and aggressive training programs within the wing. This program coupled with his management and inspection techniques resulted in constant superior performance. He has received high praise from division and wing commanders for superior contributions, and consistently displays those qualities most needed in today's Air Force. Sgt Fischer is a valuable asset to the SAC maintenance effort and the United States Air Force.

TITAN CREW

Crew R-164, 381st SMW, is Titan Crew of the Month and includes: 1Lt Dale R. Madison, MCCC; 2Lt Carlos L. Gallardo, DMCCC; A1C Greig H. Elliott, BMAT; and Sgt George R. Moore, MFT. Two hours prior to the relief crew arriving on complex, the vapor detector malfunction light came on. Consulting tech data, the crew commander dispatched the BMAT and MFT to investigate the malfunction. Cannister masks and a portable vapor detector were taken. Upon entering the long cableway, the two crewmembers noted a five parts per million readout on the oxidizer side of the portable vapor detector. The oxidizer vapor hazard checklist was run and the BMAT and MFT were dispatched topside in the required protective clothing. Emerging from the access portal, they reported that an oxidizer vapor cloud was coming out of the exhaust shaft. The missile potential hazard team was informed of the dangerous situation and directed the MFT and the BMAT to monitor the direction and density of the toxic cloud. The crew aided the MPHT and propellant transfer team until the hazardous situation was under control. Crew R-164 is an outstanding missile combat crew. Their professional approach, dedication to duty, and leadershp warrant their selection as Titan Crew of the Month.

MINUTEMAN CREW

Crew S-072, Capt Martin R. Stytz and 1Lt Ronald S. Jackson, 351 SMW, are named Minuteman Crew of the Month. While on alert at the alternate command post, the crew experienced a loss of dial lines one and two due to a cut telephone cable. Their condition was further compounded by a lightning strike to a transformer which resulted in a loss of commercial power to the LCF. The motor generator failed to switch over to emergency battery power and as a result the LCC was placed in total darkness. The crew rapidly and accurately shut down the LCC to prevent an unsequenced start up of equipment before the standby diesel power came on line. This action prevented a fire and possible equipment damage when power returned. With total loss of communications the crew was forced to evacuate the ACP and go topside to contact the other LCCs. Capt Stytz and Lt Jackson spent the next five hours controlling access to sealed authenticators and other classified material in the LCC, conducting periodic inspections for fire below ground and coordinating maintenance and wing command post actions. At 2300 local, maintenance arrived at the site. The maintenance team and the crew returned to the LCC and spent the next five hours correcting the malfunction and returning the ACP to alert condition. Four hours later, a local ORI (LORI) was initiated. The crew coordinated squadron and wing response to the LORI, and began preparing for the arrival of the alternate Battle Staff (ABS). The crew provided valuable assistance to the ABS in maintaining wing status and reacting to problem scenarios. Their abilities and professionalism throughout 17 hours of an unusual and arduous alert saved expensive equipment and insured that the ACP was off alert for a minimum of time and that the LORI was successfully conducted.

M-X

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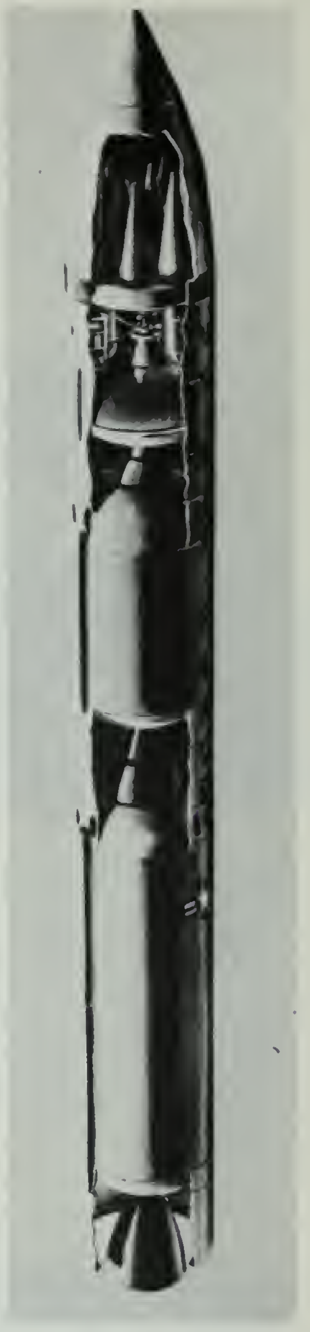
In the late sixties, under the Advanced Missile Options Program, the nature of the ICBM itself was examined: should we use existing missiles for a new program or should a new missile be derived from our most advanced technologies? Alternatives to a new missile ranged from various schemes of upgrading the MINUTEMAN force to adaptations of sea-launched ballistic missiles as ICBMs. The Advanced Missile Options Program evolved into a SAC effort to produce a Required Operational Capability (ROC) for an advanced ICBM. M-X had its real beginning in 1971 when SAC documented such a requirement. The performance characteristics required by this document exceeded anything currently available. An Advanced Development Program was begun in late 1973 to define the technologies required to accommodate these performance characteristics.

The missile design which has emerged from the years of research and study incorporates our best ballistic missile technological know-how. The M-X will be a three-stage, solid-propellant missile with a liquid fueled post-boost vehicle capable of delivering at least 10 MIRVs to intercontinental ranges. It will be approximately 70 feet long, 92 inches in diameter, and weigh over 190,000 pounds. Other features include a new third stage propellant and single nozzles on all stages, extendable on the second and third. The missile "skin" will be made of a lightweight material called Kevlar. The guidance system is an Advanced Inertial Reference Sphere (AIRS) which has a "floated ball" Inertial Measuring Unit (IMU) and is packaged in a "box" as opposed to a "wafer." The missile will be placed in a canister for horizontal mobility and safe environmental storage. A steam generator system "pops" the missile out of the canister in a cold launch. The first stage engine then ignites and propels the missile into flight. Two hundred (200) of these missiles will be deployed, each mounted on a large vehicle called a Transporter. The Initial Operational Capability (IOC) is scheduled for 1986 with Full Operational Capability (FOC) in 1989.

The controversial and critical M-X issue is basing. The system's key element, survivability, is primarily dependent upon a combination of many shelters (or aimpoints), preserving missile location uncertainty among them, and the capability to employ varying degrees of mobility. Extensive basing areas are required to deploy such a system.

The concept of a mobile ICBM predicated upon some form of deception, however, is not new. Since the sixties, railroads, roads, dirigibles, air cushion vehicles, merchant ships, towed floating canisters, etc., have been examined. Since 1975, concepts using pools, buried trenches, missile-bearing aircraft, and vertical and horizontal shelters have been carefully scrutinized for M-X. In all, nearly 40 such basing options have been examined during the past 15 years. The horizontal shelter basing mode selected for FSED, in addition to a multitude of necessary technical details, satisfies the following Presidential guidelines: survivability, verifiability (for Strategic Arms Limitations reasons), reasonable cost, public acceptance, and minimal environmental impact.



M-X missile, 70′ x 92″, 190,000 pounds, approved for Missile-X system. Three solid propellant motors provide 7,000 nm range capability, and 10 nuclear warheads are carried in post boost vehicle.

Next month's issue of Combat Crew will cover deployment, maintenance, and operation of the M-X system.

SAC SAFETY SCREEN

320 BMW, Mather Crew E-10: P Capt Myhre E Paulson, Jr, CP 1Lt Robert T Miller, RN Capt James A Petrilli, N 1Lt Stephen F Martindale, EW 1Lt Charles H Nicholls, G A1C Bernard H Demel
307 AREFG, Travis Crew E-109: P Capt Ronald L Barry, CP Capt James L Langenhahn, IN Capt Richard G Viray, IBO SSgt Roger S. Page
100 AREFW, Beale Crew E-113: P Capt James D Caracciola, CP 1Lt Bruce G Billig, N Maj Gaylord H Winge, Jr, BO Sgt Coleen D Collier
28 BMW, Ellsworth Crew R-07: P Maj Nicholas J Hinch, CP Capt Neil W Schaal, RN Capt James L Frey, N 1Lt Christopher A Dahlstrom, EW 1Lt Robert C Knox, Jr, AG SrA Kelley E Fletcher
9 SRW, Beale Crew S-44: P Capt Paul G Roberts
96 BMW, Dyess Crew E-105: P Capt Ken Black, CP 1Lt Dan Kaiser, IN Capt Mike Lewis, IBO SSgt Randy Lane
305 AREFS, Grissom Crew S-122: P Capt William J Murphy, CP Capt Michael W Byron, IN Capt Michael A Cummings, IBO Capt James A Justice
384 AREFS, McConnell Crew E-158: P Maj Frank E Salat, CP Capt Donald F Novak, IN Capt Jack W Wilder, Jr, BO A1C David S Rutledge
91 AREFS, McConnell Crew R-104: P Capt Thomas L Leming, CP 1Lt John W Elliott, N 1Lt Martin J Clement, BO Sgt Danny R Gilson
44 SMW, Ellsworth Crew R-021: MCCC 2 Lt John A Brown, DMCCC 2 Lt Richard E Pope
90 SMW, F E Warren Crew R-189: MCCC Capt Jefferey G Gammell, DMCCC 2Lt Ross G Gobel
91 SMW, Minot Crew E-001: MCCC Capt Gerhard H Dosher, DMCCC 2Lt Larry D Abney
308 SMW, Little Rock Crew R-012: MCCC Capt Lester H VanBlaricom, DMCCC 2Lt William H Frazier, MSAT SSgt Marvin H McArthur, MFT A1C Michael J McMullen
321 SMW, Grand Forks Crew R-143: MCCC 1 Lt Stephen D Vining, DMCCC 2Lt James F Garcia
341 SMW, Malmstrom Crew E-188: MCCC Capt William E Harris, DMCCC 2Lt James W Terry
390 SMW, Davis-Monthan Crew S-050: MCCC Capt Daniel T Jackson, DMCCC 1Lt Patrick F Tria, MSAT SSgt Eugene L Pearson, MFT SrA Gregory W Bertram

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW AFR 127-2/SS1.*

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A crew chief works on the horizontal stabilizer of an FB-111A prior to flight.

FLARE